

## CLAIMS

What I claim as my invention is:

1. A concave 1 1/2 hour fire-rated door comprising of:
  - a. a concave fire-rated door circular in nature with offset pivot points, heavy duty greasable bearings with a thrust bearing located at bottom and the pilot bearing located at top;
  - b. an extremely effective noncombustible framework constructed of a U channel - 9 X 13.4, supported by 2 1/2" mounting plates - 1 top and 1 bottom, with 1/2" square stock on top;
  - c. an extremely effective noncombustible door panel constructed of steel - ASTM A36, 3/8" steel plate on top and bottom, and 1/8" plate on outer skin;
  - d. several substantially reinforcing 1/4" thick angles, attached by tack welding to aforementioned door panel for added structural support to panel, thus limiting warping of door panel when exposed to heat;
  - e. along the sides of said door panel, a strip of 3/8" bent flat stock is attached by welding to said door panel by tack welding, thus providing support, strength, as a guide, as a stop for the swing, and as a seal once the gasket seal is in place;
  - f. an extremely effective high temperature resistant gasket seal interjected between door panel and frame onto said bent flat stock and extending

around perimeter of door panel to form an airtight barrier, said seal being comprised of an intumescent gasket, providing a safe, efficient system for sealing air space between door and frame in case of fire. When exposed to heat and/or fire, the intumescent material expands to fill any gaps, any penetration by hot gases, smoke, heat and flames is blocked for up to three hours, the said intumescent beginning to expand at 250 degrees Fahrenheit (121 degrees Celsius) on the big door and 350 degrees Fahrenheit (176 degrees Celsius) on the small door;

- g. an extremely effective additional seal along the top of door is added, with said seal being comprised of a fire-retardant fire seal cloth housing a mat made of lightweight thermally efficient ceramic fibers that combine dimensional stability at high temperatures with complete resistance to thermal shock, creating an air seal; thus giving the intumescent seal time to activate;
- h. an extremely effective heavy duty door closure is utilized in order to close door properly to meet UL requirements; this door closure meets ADA reduced opening force requirements; has adjustable hydraulic backcheck cushions; made with a cast iron cylinder; one piece forged steel piston; double heat-treated pinion; all weather fluid; high efficiency, full compliment low friction bearings; full rack and pinion hydraulic action;
- i. a latch lock catch plate attached to said doorframe with weld tacks, said latch lock catch plate having a latch opening and a deadbolt opening;
- j. a box-shaped latch plate attached to said door panel, said latch plate having a latch handle opening and a deadbolt opening;
- k. a lockset with a 3/4" throw and with a 1" deadbolt; this mortise lockset

meets A156 13 Series 1000 Operational and Security Grade 1, meets A117.1 Accessibility Code, and meets FF-H-106C; this mortise lockset works in tandem between the throw and deadbolt, from the front side the activation of the latch handle will release both the deadbolt cylinder and the throw cylinder;

- l. latch handle on front side of said box-shaped latch plate on said door panel and a second latch handle on backside of said box-shaped latch plate on said door panel;
- m. a connecting member extending through said box-shaped latch plate on said door panel interconnecting said first handle to said second handle;
- n. a latch member associated with said connecting member positioned and oriented to be received within the latch opening on said latch plate on said door frame and be engaged with said recess of said latch plate when said door is in a closed position and said seal member is in a compressed state, whereby rotation of one of said first and second handles releases said latch member from said recess;
- o. thumbscrew on front side of said box-shaped latch plate on said door panel and a keyed cylinder on backside of said box-shaped latch plate on said door panel;
- p. a connecting member extending through said box-shaped latch plate on said door panel interconnecting said first thumbscrew to said second thumbscrew;
- q. a latch member associated with said connecting member positioned and oriented to be received within the latch opening on said latch plate when

- said door is in a closed position and said seal member is in a compressed state, whereby rotation of thumbscrew on front side of said door panel releases said latch member from said recess; and rotation of key inserted into keyed cylinder on backside also releases said member from said recess; this is a mortise lockset and rotation of handle on box-shaped latch plate will release both latch cylinder and deadbolt cylinder;
- r. whereby said concave fire-rated industrial door is capable of substantially maintaining a seal between said doorframe and said door panel when subjected to high temperatures;
  - s. an extremely effective noncombustible frame and door panel configured to be mountable in an underground tunnel system.
  - t. the concave fire-rated door of medium high static pressure, also has a blast rating; blast calculations being used are 1/2 static load. Due to these unique properties, this door is a multi-use door. It's corrosive resistance is due to its coating, also due to it's convect design, this door will open or close easily even under high static pressure. This is the only UL rated door presently available in this unique design.